REMARKS

Applicant would like to thank the Examiner for the careful consideration given the present application. The application has been carefully reviewed in light of the Office action, and claims 1, 4, 5-15, and 18-19 have been amended to more clearly describe the subject matter which applicant regards as the invention and also to address the Examiner's 35 USC 112 rejections. Further, claims 2-3, 17, and 20-28 have been cancelled. New claims 29-44 have been added. Reconsideration of the application in its current form is hereby requested.

The Examiner has objected to the phraseology used in the claims wherein it is defined that the length of the upstream processing station is increased or extended. This phrase has been changed in the present amendment. However, it is noted that the space or length along the conveyor provided for each process or processing station is a defined quantity. The present invention defines a method wherein the defined processing station length is increased so that the operator may have the further opportunity to complete the assigned assembly process. It is submitted that the claims are entirely consistent with the description of the inventive method set forth in the specification. Moreover, it is submitted that the Examiner's interpretation of the claims is in error, and was clearly only resorted to permit the Examiner to formulate a rejection of the claims. Thus, withdrawal of the rejection based upon Section 112 is hereby requested.

Further, it is noted that the Examiner may not simply disregard the steps following the step of "if the upstream processing function in the upstream processing station is not completed". Clearly, the present method can only be performed if all of

the steps are performed, and the Examiner's disregard of specific method steps is contrary to the fundamentals of US patent law and, frankly, the first time that the undersigned has ever experienced a rejection based upon such a novel position by an Examiner. If the Examiner intends to maintain this rejection and not consider each step of the method, the undersigned would appreciate receiving further information, and authoritative support (i.e., MPEP, case law, etc.) for the Examiner's position.

Nevertheless, in the interests of advancing prosecution, the aforementioned portion of the claims has been reworded. Thus, reconsideration of the claims in their present format is hereby requested.

The present invention, as presented in claim 1, provides a method of controlling an assembly line. The method involves designating a first processing station on the assembly line and *providing an entry signal representative of arrival of an article in the first processing station and/or an exit signal representative of departure of the article from the first processing station.*

A first article is delivered to the first processing station and *a designated processing function is provided at the first processing station.* The designated processing function is monitored on the first article within the first processing station *over a monitoring period according to the entry signal and/or the exit signal.*

The method is particularly concerned with the situation in which the designated processing function in the first processing station on the first article is not complete *within the monitoring period.* When that situation occurs, the method includes the step of issuing a signal to an operator in the first processing station that the designated processing function on the first article is not complete. The first

processing station is *extended along the assembly line to allow the operator an additional length portion of the assembly line* to complete the designated processing function.

The method also includes monitoring the designated processing function in the extended first processing station. If the designated processing function on the first article is not complete in the extended first processing station, the method provides for associating a label with the first article for remedial attention and advancing the first article along the assembly line from the extended first processing station.

Claims 1-28 stand rejected under 35 USC 102 (b) as being anticipated by US 5,088,045 to Shimanaka. Further, claims 1-28 stand rejected under 35 USC 103(a) as being unpatentable over Shimanaka in view of US 6,502,301 to Guner. For the following reasons, the Examiner's rejections are traversed.

US 5,088,045 to Shimanaka discloses a production management system which controls a production line having a plurality of assembling/machining stations including pieces of production equipment such as nut runners.

Shimanaka's aim is to reduce the quantity of data exchange through a production control network which, in his view, greatly degrades operating efficiencies. Data exchange is reduced by providing a main network 12 serving as an information network for transmitting data bearing information as to "results" of operations or the like, and subnetworks 14a through 14c associated respectively with a plurality of separate assembling/machining lines 13a through 13c, the subnetworks 14a through 14c serving as information networks for transmitting data bearing "control" information, each for the ongoing operations of its own

assembling/machine line.

Each subnetwork includes a line side computer beside each station and with a display unit. Each display unit includes diagrams indicative of results of operations from previous processes. The diagrams also include whether components have been properly fastened based on assembling specifications. The diagrams are stored as outer profile indication data and operating position indication data.

The production management system establishes "track times" in view of the number of automobiles to be produced, a standard operation time, a rest time, etc., and the production line 10 is operated according to the track times.

Shimanaka also provides for assembling/machining stations requiring manual operation, such as the fourth assembling/machining station STa4. For these particular "manual" stations, Shimanaka provides "repair times" in addition to the time in which to effect their own operation, so their track times include such "repair times".

Shimanaka notes the following:

-> The host computer 16 is associated with a quality monitor data file 54 for storing diagrams indicative of results of operation to be displayed on the display units 23a through 23g of the line side computers 24a through 24g. As shown in FIGS. 3 and 4, the *diagrams indicative of results of operation include diagrams of parts or components such as a run roof, an instrument panel, a bumper, etc. as workpieces to be installed on an automobile body, and diagrams indicating whether the components have been properly fastened or not based on assembling specifications. The diagrams are stored as outer profile indication data and operating position indication data.*

-> *The production management system is started to establish track times in view of the number of automobiles to be produced, a standard operation time, a rest time, etc.*, and the production line 10 is operated for the track times. Since assembling/machining stations requiring manual operation, such as the fourth assembling/machining station STa4, *need repair times in addition to the time in which to effect their own operation, their track times include such a repair times.*

-> When the block control panel 22a receives operation completion signals indicating the completion of operation in the assembling/machining stations STa1 through STan from the robot controllers Ra1 through Ram, these signals are sent to the overall control panel 20a. The overall control panel 20a controls all carriages running on the assembling/machining line 13a corresponding to the subnetwork 14a, and also carriages moving between the assembling/machining stations STa1 through STan at all times. The overall control panel 20a transmits movement permit signals to self-propelled carriages through the block control panel 22a.

-> The self-propelled carriage then runs toward a downstream assembling/machining station. Since tightening failures have been taken place in the second and third assembling/machining stations STa2, STa3, the diagrams 201, 209 are successively displayed on the display unit 23b of the line side computer 24b disposed on the side of the fourth assembling/machining station STa4.

-> The diagrams 201, 209 displayed on the display unit 23b are shown by way of example in FIGS. 6 and 7. The displays shown in FIGS. 6 and 7 are referred to as quality monitor displays. FIG. 6 shows the display unit 23b which displays the diagram 201 indicating operation failures that have occurred in the second assembling/machining station STa2. *The letters R, B in the small circles at the tightening locations 202a, 202b, 204a through 204d, and 206a through 206d indicate that the small circles are displayed in red and blue, respectively. In FIG. 6, the tightening locations 202b, 204b, 206c which are subjected to the operation failures, i.e., bolts are tightened improperly, are displayed in red (R), and the other tightening locations where bolts are tightened properly are displayed in blue (B).*

-> *The worker M2 then effects a corrective action in the tightening locations 202b, 204b, 206c for example by removing chips from the corresponding threaded holes in the workpiece W and tightening the bolts with a manual nut runner (not shown).*

Thus, Shimanaka contemplates that repairs will routinely be done at a specified "manual" station along the assembly line. It is submitted that Shimanaka does not provide any teachings or motivation toward providing an extended work station *along the assembly line to allow the operator an additional length portion of the assembly line* to complete the designated processing function. Rather, Shimanaka accumulates data for a repair station further along the assembly line. Thus, it is submitted that Shimanaka provides a completely different solution to

the same problem, and therefore cannot be readily interpreted, or even modified, to include the features of the present invention as defined in claim 1.

Furthermore, to provided such extended work station would be counter to Shimanaka's teachings which are limited to presetting and fixing the "track times" for each station in advance and not to change it for that particular production run.

US 6,502,301 to Guner discloses a manufacturing plant and system for manufacturing rigid bodies. Guner's method is alignment based and provides a skills hierarchy for mobile assembly workers, who perform their define alignment task by moving from one work station to the next. Guner discusses a conventional assembly method in the paragraph spanning columns 1 and 2 and indicates that:

> "Also long learning curves are required for operators to manufacture new products which result in unplanned jobs. Learning is limited with conventional manufacturing operations, since operator expertise is linked to specific output types and tools. Therefore, operators typically require new training whenever products and components are added or modified. In addition classical progressive lines cause worker idle time. The classical, balanced progressive line (e.g., a conveyor-driven assembly line) regulates the rate of production and enforces a maximum rate of productivity for every operator which cannot be faster than the slowest operator's rate of productivity. Therefore, all other operators must wait, in varying amounts of time, depending on their own productivity rate. *Operators try to complete a job (e.g., install a part) within a fixed time interval. If they cannot perform the job within the allotted time interval, then it is finished at subsequent work stations. This has the advantage of guaranteeing a certain sustained rate of production. However, the disadvantage is that some workers will inevitably exceed the standard rate of production, and must wait, since no worker can go faster than the regulated production rate. Typically, there is a great deal of slack in standard production rates, which are often set below the productivity capacity of most workers (so that the great majority of, if not all, workers can achieve the standard rate).*

Guner teaches that his system:

-> has a number of "alignment units", each having at least three "work stations" and at least two operators.
-> allows the operators *to work at their own speed*
-> provides operator rotation to eliminate idle time and to avoid *"conflicts of interest"*. (As noted below, Guner avoids "conflicts of interest" by having one

operator insert only one fastener to join two parts normally held by, say, four fasteners, leaving lower skilled operators to install the remaining three fasteners.)

-> provides a minimal if not zero operator idle time thereby resulting in increased productivity while maintaining sustained production rates

-> detects quality deviations at *the next work center or station* in the flow because typically the next operation or sequence cannot be performed if the previous operation was performed poorly or incorrectly, reducing the need for reliance on external quality control monitoring.

-> relaxes material delivery constraints because *since the operators are mobile* and can move from station to station, the operators can pick up parts over a wider area during their movements between work stations.

-> achieves continuous manufacturing *with alignment units that are self scheduling requiring no external scheduling or expediting.*

Guner notes the following:

-> *Thus, an operator has more than one chance to prepare/align the material and tools prior to performing the actual operation. If the operator makes a mistake in preparing the material, the operator may re-prepare the material without causing a defect.* Thus, an operator has multiple chances to "get it right" prior to performing the actual operation. (For example, some positioning operations allow the operator to target a position via a red light. If the red light is off target, it may be re-positioned without causing a defect. Once the red light is on target, it is safe for the actual operation to proceed.) In contrast, with an overlay operation, alignment is an ongoing, dynamic activity that occurs concurrently and continuously with the actual operation. If an overlay operator makes a mistake in dynamically positioning the work-in-process, a defect will result. Therefore, overlays require greater expertise than positioning operations.

-> Operator rotation at different work stations in addition to eliminating idle time also makes it possible to avoid "conflicts of interest" which can occur when the same part is aligned by the same operator on multiple occasions and one or more subsequent alignments depends on one or more earlier alignments. When such a conflict of interest occurs, the operator has an incentive to "hide" previous mistakes by performing "pseudo-repairs" which do not fully undo the mistake, but are sufficient to reduce the chance of detection. On the other hand, if a new operator performs an alignment on a part that was misaligned by an earlier operator, the new operator has no incentive to cover up the mistake but in fact has an incentive to report the mistake so that he/she does not run the risk of being associated with the defect.

-> The plant, system and method of the present invention requires the use of a mobile rotating work force comprising a plurality of operators in which the number of work stations 13 will always be greater than the number of operators *so that each operator is capable of being able to move to another work station after the operator has finished an operation at the work station he/she is presently located, thereby avoiding idle time, one of the principal tenets of the present invention.*

It is submitted that Guner teaches an assembly method that is fundamentally different from the Shimanaka method disclosed in US 5,088,045.

Where Shimanaka suggests:

a) tracking each step in an assembly station procedure and transferring that data to a downstream station, including data for later repair; and

b) fixing the "track times" for each station "*in view of the number of automobiles to be produced, a standard operation time, a rest time, etc.*"

Guner teaches that *no such data record* is required, since the next operator is capable of detecting the error of an earlier operator, a benefit flowing from avoiding the "conflict of interest".

Further, with reference to claim 1, Guner does not teach or suggest extending the first processing station when a process is incomplete. Since the step of extending the first processing station is found in claim 1 and its dependent claims 4 through 16, and since this feature is lacking from both Shimanaka and Guner, it is submitted that even if these references were combined, the present invention as defined in claim 1 would not result. Accordingly, it is submitted that the Examiner's rejection based upon the combination of Shimanaka and Guner is traversed.

Many of the foregoing comments regarding claim 1 are also believed to be relevant to the other independent claims (i.e., claims 18, 19, 29, 43, and 44), but will not be repeated for interests of brevity.

Independent claim 18 recites an assembly line with first and second processing stations, with the first and second process means being operable to extend the corresponding processing station when the corresponding processing function is not complete. It is submitted, for the reasons set forth hereinbefore, that

neither of the cited reference teach or suggest such an assembly line.

Independent claim 19 similarly includes the limitation of extending the first processing station, and is allowable over the art of record for the same reasons as discussed previously with regard to claim 1.

Independent claim 29 and dependent claims 30 to 42 recite a system with a processing line, in which a first processing station is monitored by a process monitor which is operable to extend the length of the processing line corresponding to the first processing station to form an extended first processing station for the operator to complete the first processing function. It is submitted, as noted previously, that the cited art fails to teach such a process monitor.

Claim 43 similarly includes the limitation of extending the first processing station, and is allowable for the reasons set forth hereinbefore.

Claim 44, similarly includes the limitation of extending the first processing station. Claim 44 also includes the additional limitation of advancing a second article to the first processing station for the designated processing function, thereby temporarily resulting in both the first and second articles being present in the first extended processing station. Such an arrangement is not taught by the art of record.

In light of the foregoing, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 18-0160, our Order No. GAS-14771.001.

Respectfully submitted,

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